09/865,802 190-892

PCT

INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification 7 : G06F 17/60	A1	(11) International Publication Number: **WO 00/23929**
		(43) International Publication Date: 27 April 2000 (27.04.00)

(21) International Application Number: PCT/US99/24453

(22) International Filing Date: 19 October 1999 (19.10.99)

(30) Priority Data:
60/104,829   19 October 1998 (19.10.98)   US
09/343,547   30 June 1999 (30.06.99)   US

(71) Applicant: HARDWARESTREET.COM, INC. [US/US]; Suite 305, 5190 Neil Road, Reno, NV 89502 (US).

(72) Inventor: ALVIN, Robert, S.; 187 Redwood Drive, Boulder Creek, CA 95006 (US).

(74) Agent: KANANEN, Ronald, P.; Rader, Fishman & Grauer PLLC, Suite 501, 1333 20th Street, NW, Washington, DC 20036 (US).

(81) Designated States: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, UZ, VN, YU, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).

Published
With international search report.
Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.

(54) Title: DYNAMIC SELECTION OF MULTIPLE DISTRIBUTORS
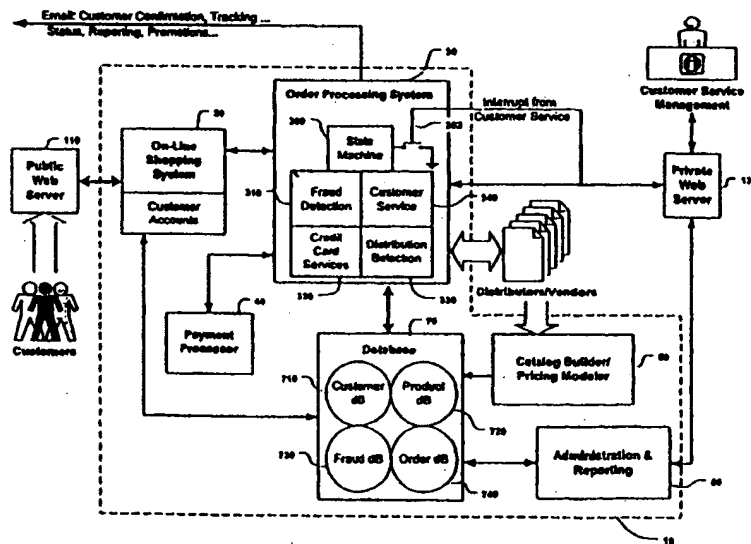
(57) Abstract

An Internet business transaction processor of the present invention has a distributed processing architecture which allows the processing load to be distributed among multiple parallel servers. The transaction processor of the present invention provides a virtual store front utilizing "other people's warehouse" approach by using a dynamic distributor selection processing system to select among a plurality of distributors based on flexible rule-based algorithm. Furthermore, a multi-level fraud check processing system allows orders to be processed that would otherwise be discarded to generate a higher yield in sales.

TITLE OF THE INVENTION

Dynamic Selection of Multiple Distributors

FIELD OF INVENTION

The present invention relates to business
5   transactions conducted over the Internet and in
particular to a transaction processor to conducting the
same capable of performing dynamic selection of a
distributor among a plurality of distributors based on
dynamic selection criteria.

10   BACKGROUND OF THE INVENTION

Traditionally, commodities such as computer related
products, for example, have been sold primarily through
retail stores and catalogs and, more recently, through
telephone sales supported by infomercials and other print
15   and media advertising. However these traditional models
for selling computer related products suffer significant
disadvantages.

Store-based retailers have limited shelf space due
to costly inventory and real estate investment
20   considerations. This limits the number of products store-
based retailers can offer to their customers. Also, the
personnel required to operate stores are expensive and
can be difficult to hire and train. The physical store's
need for personnel also limits the flexibility and
25   efficiency of the sales process. The number of customers
that can be served and the quality of service is
dependent on the number of personnel dedicated to the
sales process.

Store-based retailers also face the financial risk
30   of carrying inventory that may quickly become obsolete.
Physical possession of inventory also limits the speed at
which these retailers can change their merchandise mix
and offer new products. This is because a store must

physically obtain, set up and display the products.
Physical stores also can only serve customers in a
limited geographic area because the customers must travel
to the store to shop. To extend this limited reach, new
5   stores must be opened in different geographic locations.
However, the time required and the significant
investments in inventory, real estate and personnel
required at each new location, make it difficult to
expand quickly into new geographic regions.

10   Catalog-based (e.g., mail-order) retailing provides
only a partial solution to the disadvantages of store-
based retailing. Catalogs do provide customers with the
convenience of shopping from home or the office at
flexible times. However, catalog merchandising is costly
15 and wasteful because paper, printing, and postage are
increasingly expensive and a large percentage of people
to whom catalogs are sent will not use them. Also, the
number of products catalogs can feature and the product
information they can provide are limited due to catalog
20 mailing, printing and other related expenses.

        Catalogs are also very inflexible and provide only
limited accessibility. In order to change products or
prices, the catalog must be reprinted and redistributed
which is both costly and time consuming. Furthermore,
25 catalogs' accessibility is limited in that they are
available only to those people to whom they are sent.
Also, the catalog shopping experience is, in general,
neither interactive nor personalized, yet requires
extensive personnel support and manual intervention on
30 behalf of the retailer to take and process orders.

        The more recent advent of the combination of
infomercials and other advertising supporting telephone
sales also provides only a partial solution. The ability

to order by phone provides the same inconvenience that the catalog does. However, infomercial and other advertising is extremely expensive. They are also limited in their geographic scope. Typical media outlets serve

5   only a relatively small geographic area. To expand the geographic scope of advertising, additional media outlets in different locations must be used. This greatly increases expenses. Advertising is also limited in duration. Expense increases drastically upon extending

10   the term of the advertising.

The advertisements and infomercials that describe the products are also limited in the scope of products they can cover. The expense limits the size of print advertising and the duration of radio and television

15   advertising. These limitations restrict the number of products that can be covered. They also restrict the amount of information that can be provided for the products.

Recently, the Internet has emerged as a powerful new

20   global communications and commerce medium that represents a radical new way for people to share information and conduct business electronically. Though the Internet has been well known for several years, it has been mainly used for research and as an educational medium. Hence

25   people were initially slow to adopt it as a common means of conducting retail commerce. However, with technology advancing such that personal computers are now an affordable commodity for the average household, more and more personal computers are being acquired for home

30   usage. In conjunction with increased computer awareness and usage, affordability and ease of accessibility to the Internet from an average household has given birth to a

4

new type of commercial medium referred to as Electronic
Commerce (i.e., E-Commerce).

The increasing functionality, accessibility and
overall usage of the Internet have made it an attractive
5 commercial medium that can offer solutions to many of the
shortcomings of the traditional retail models. For
instance, the Internet has radically changed the
relationship between customers. Online retailers can,
from a single remote computer, interact directly and
10 simultaneously with customers across the globe.

The Internet also eliminates the traditional retail
models' limited availability and barriers to expansion.
On the Internet, a store is accessible throughout the
world around the clock. The limitations associated with
15 printed catalogs are eliminated as well. There is no
incremental cost associated with making Internet content
available to people who will not use it. Internet also
provides easy adaptability to changing market conditions
and allowing an interactive, customizable retail
20 experience.

Online retailers can respond more rapidly to
customer demand by frequently modifying their product
offerings, shopping interfaces and pricing, simply by
modifying their Web site. Additionally, the Internet
25 improves on the limited amount of information that can be
conveyed in the catalog and advertising/telephone sales
models of retail sales. Web sites are inexpensive
relative to the number of potential customers they reach,
allowing much more information can be provided on a Web
30 site than in any advertisement.

However, even with the advantages that is associated
with the usage of the Internet as a commercial medium,
there are still drawbacks in the currently existing E-

Commerce retail businesses. In particular, most E-Commerce retail businesses mainly use the Internet and Web pages as an advertising medium to replace the previous catalog/infomercial type advertisements.

5   Although some of the businesses have begun accepting product orders online via email or Web pages, the current E-Commerce businesses for the most part have adopted a hybrid business model in which the traditional business models are coupled with E-Commerce business practices.

10   For instance, the usage of the Internet has replaced a few of the traditional business practices such as advertising and order processing, but most of the so-called E-Commerce retail businesses of the prior art still operate by maintaining an inventory. That is to

15   say, the current online businesses still maintain inventories in warehouses that store the merchandise to be sold. As described above, the costs associated with such business practices are high, especially in the computer related products market where their relatively

20   short life cycle and the rapid adoption of new technologies and products make the traditional inventory store and catalog sales models particularly problematic. If the computer products are not sold in a relatively short period of time, the unsold merchandise will become

25   obsolete due to the fast pace in which technology is evolving.

SUMMARY OF THE INVENTION

       It is the object of the present invention to meet the above-identified needs and others. Specifically, the

30   present invention provides an Internet based E-Commerce business transaction processor that overcome the disadvantages of the prior art systems by creating a virtual store front having "other people's warehouse"

approach to avoid maintaining physical stores and
operating warehouses while maintaining such practices
transparent to the customer.

The business transaction processor of the present

5   invention has a modular design comprising a plurality of
distributed transaction processing systems, allowing the
processing load to be distributed among multiple parallel
servers thereby providing faster processing of
transactions while providing expandability for future

10   growth.

The business transaction processor of the present
invention interacts with multiple distributors thereby
providing a larger selection of products with higher
availability with aggressively competitive pricing all

15   the while maintaining gross company margins.

The business transaction processor of the present
invention utilizes multi-level fraud checking system that
incorporates propriety as well as commercially available
fraud checking system thereby providing a higher level of

20   risk management while providing a fraud check system that
is not exclusively dependent on commercially available
services.

The business transaction processor of the present
invention is fully automated including automatic

25   generation of an electronic catalog, competitive pricing
engine based on flexible rule-based algorithms, and
automatic feedback to the customer.

Additional objects, advantages and novel features of
the invention will be set forth in the description which

30   follows or may be learned by those skilled in the art
through reading these materials or practicing the
invention. The objects and advantages of the invention

may be achieved through the means recited in the attached claims.

BRIEF DESCRIPTION OF THE DRAWINGS

The accompanying drawings illustrate the present
5 invention and are a part of the specification. Together with the following description, the drawings demonstrate and explain the principles of the present invention.

Figure 1 is a block diagram showing the overall system of the present invention.

10 Figure 2 is a state diagram of the order processing of the present invention.

Figure 3 is a flow diagram showing the fraud processing according to the present invention.

Figure 4 is a flow diagram showing the distributor
15 selection processing according to the present invention.

Figure 5 is a block diagram showing the distributor selection logic according to the present invention.

Figure 6 is a flow diagram showing the distributor selection logic sequence according to the present
20 invention.

DETAILED DESCRIPTION OF THE INVENTION

Using the drawings, the preferred embodiments of the present invention will now be explained. As shown in Figure 1, the Internet business transaction processor 10
25 of the present invention has a distributed processing design allowing the processing load to be distributed among multiple parallel servers. The Internet business transaction processor according to the present invention is comprised of an Online Shopping System 20, Order
30 Processing System 30, Payment Processing System 40, Catalog Builder/Price Modeler 50, and Administration System 60. The transaction processor 10 of the present invention also includes a main database 70 comprised of a

Customer Database 710, Products Database 720, Fraud
Database 730, and Order Database 740.

According to the present invention, a customer
accesses the Online Shopping System 20 via a public Web

5 server 110 to obtain product information available for
purchases, set up a customer account, check order status,
etc. The Order Processing System 30 receives the product
order requests and processes the orders to check for
availability with multiple distributors, orders the

10 products based on pricing information, performs credit
card validations, etc. The Payment Processing System 40
processes the method of payment once the orders have been
properly processed. The Catalog Builder/Price Modeler 50
builds information of the products offered by the

15 distributors to be made available by the Online Shopping
System 20 to the customer as well as the prices at which
these products will be offered based on a pricing model
to be described in detail below. Customer service
representatives and managers have access to all of the

20 information in the database via the Administration System
60 through a dedicated secure Web server 120 available
only to authorized personnel. The Administration System
60 is used to produce reports of sales, reconcile order
discrepancies, manually adjust prices, approve credit,

25 etc. Functionality of each of the sub-systems will now
be explained in detail.

Online Shopping System

The Online Shopping System 20 is the main interface
between the customer and the E-Commerce business and is

30 primarily responsible for providing the overall online
shopping experience to the customer. The Online Shopping
System 20 of the present invention provides an electronic
catalog of available products stored in the Products

Database 720 along with the price of the product. This information is generated by the Catalog Builder/Price Modeler 50 to be descried in detail below.

The electronic catalog is a Web page, for example, that dynamically displays product information from the Products Database 720. Consequently, the electronic catalog is always up to date with the most recent product information and does not suffer from the same shortcomings as that of the prior art cataloging systems. Furthermore, because each product is displayed as a dynamic variable, a new catalog does not have to be generated every time the Product Database 70 is updated. Only the updated product information will be changed in the catalog.

In conjunction with the electronic catalog, the Online Shopping System 20 provides an electronic shopping cart that keeps record of each item marked to be purchased by the customer and provides a finalized shopping list and the total amount purchased at the end of a shopping session which may include appropriate taxes and shipping/handling charges. The Online Shopping System 20 is also used to create customer accounts with such information as customer name, billing address, telephone number, email address, etc. and this information is stored in the Customer Database 710. Such information is used by the transaction processor 10 for billing, order notification, promotional/incentive distribution, etc. A customer may also access the Online Shopping System 20 to track the status of previous orders and returned merchandise, send inquiries to Customer Service, etc. Furthermore, customer accounts can be used to generate customized portfolios based on purchase patterns of individuals to provide targeted advertising,

purchase incentives such as electronic coupons and
rebates, specialized promotions and competitive pricing
of high demand products.

Catalog Builder/Price Modeler

5   As described generally above, the Catalog
Builder/Price Modeler 50 builds the Products Database 720
with available products from the distributors as well as
the sales price for each product. With regard to the
catalog generation, the Catalog Builder/Price Modeler 50
10   receives product information from multiple distributors.
The product information includes but are not limited to
product description, quantity available, and price for
the product.

          Access to the product information from the
15   distributors may be accomplished by Telnet, FTP (File
Transfer Protocol), industry standard EDI (Electronic
Data Interchange), or any other appropriate communication
protocol including specialized client/server software
provided by the distributors.

20   Downloading of the product information from the
distributors is scheduled to run automatically by the
Catalog Builder/Price Modeler 50 so that no human
interaction is necessary unless it is desired to do so.
The product information is preferably updated continually
25   throughout the day as updated product information becomes
available from the distributors or based on other
preselected triggers. For example, all the distributor
data may be updated during certain times of the day.
Data for some selected distributors may be updated hourly
30   while product data of others may be updated every time
the web page is viewed for that product or after the
product is ordered. As the communications technology
becomes more advanced, it may be possible to maintain a

continuous connection to the distributors' network thereby obtaining real-time status of each product offered by the distributor.

For other suppliers of products that may not have such communication capabilities or does not make economic sense to provide such continuous update of product information, an alternative system may be provided for updating/accessing product information. For instance, small distributors or individual vendors may operate through a secure web site to update their product information, receive order information from the transaction processor of the present invention, and provide shipping/tracking information of their products from their companies.

Once the product information from each of the distributors is collected, the Catalog Builder/Price Modeler 50 sorts the product information to generate the electronic catalog. The Catalog Builder/Price Modeler 50 of the present invention generates multiple catalogs from the same system and allows the Online Shopping System 20 to dynamically display user specific interfaces. The Catalog Builder/Price Modeler 50 generates catalogs with different visual presentations (e.g., color, fonts, graphics, advertising, etc.) and product offerings depending on the user accessing the Online Shopping System 20 based on the user-specific information via criteria-specific templates.

For example, when a student accesses the Online Shopping System 20 of the present invention as a potential customer, the Online Shopping System 20 displays a catalog of mixed products appropriate for students with academic pricing. Alternatively, a business person who accesses the Online Shopping System

12

20 of the present invention may see a catalog of products appropriate for his or her business with available corporate discounts for that product. This way, a single system is maintained that looks and functions like many

5 different catalog shopping systems.

The pricing model used by the Catalog Builder/Price Modeler 50 of the present invention is an intelligent rule-based algorithm such as an AI (i.e., Artificial Intelligence) program generates a competitive price for a

10 product based on price of the product offered from the distributors, any specials that are being promoted for the product, and cost/profit margins from the sale of the product to the customer. Simply stated, the price of the product is a function of the profit margin. Default

15 margins are set in the rule-based programming of the pricing model, but due to its adaptability the Catalog Builder/Price Modeler 50 may automatically adjust the margins based on the rules of the pricing model and the pricing information obtained from the distributors.

20 Further, the rules of the pricing model and setting of margins may be manually modified using the Administration System 60 to be explained in detail below.

The Catalog Builder/Price Modeler 50 of the present invention uses a plurality of margins to determine the

25 sales price of a product depending on which category the product is in. For instance, the margin for the products in the first category may be set to 10% + cost since this is a category of products that the customer would most likely buy even though the price may be a little bit

30 high. On the other hand, the margin for the products in the second category may be set to 2.5% + cost in order to provide a competitive price for high demand products. Further, the margin for the products in the third

category may be set to 0% + cost due to promotionals of discontinued products, for example.

The Catalog Builder/Price Modeler 50 may be used to obtain initial sale prices of the products to be listed

5   in the electronic catalog. Furthermore, the Catalog Builder/Price Modeler 50 may also adjust the pricing dynamically based on other system data that may change throughout the day. For example, the price may be adjusted based on the amount of web site traffic, sales

10 for a particular vendor, category, or SKU, and even the time of day. Subsequently, the Catalog Builder/Price Modeler 50 may be used in conjunction with the Order Processing System 30 to be described in detail hereinafter to select a distributor to fill the order for

15 a selected product using real-time data at the time of purchase. In this way, prices of the products in the electronic catalog can be dynamically changed based on the current market for these products.

Order Processing System

20 The Order Processing System 30 of the present invention processes the orders passed from the Online Shopping System 20. The Order Processing System 30 of the present invention is comprised of four basic sub-systems: Fraud Detection 310, Credit Card Services 320,

25 Distributor Selection 330, and Customer Service 340. The overall functionality of the Order Processing System 30 is described hereinafter.

When an order for a selected product is received, the Order Processing System 30 first determines whether

30 the order is a valid order by the Fraud Detection sub-system 310. If the order is valid, then the order is sent to the Distributor Selection sub-system 330 to determine firstly if the product ordered is available and

secondly from which distributor the product will be
supplied. Once a distributor is chosen the order is
fulfilled with the distributor. After confirmation of
product shipment, the order is sent to the Payment

5   Processing System 40 via the Credit Card Services sub-
system 320 to charge the customer's credit card for the
purchase. The Customer Service sub-system 340 monitors
each of the ordering processes and can intervene anywhere
in the process if warranted.

10   Moreover, the Order Processing System 30 of the
present invention is driven as a state machine 300. As
such, a purchase order during processing enters
predetermined states as shown in Figure 2. Interrupt
switch 302 is operable to interrupt state machine 300 to

15   facilitate selective tracking of an order during
processing to determine the status of any purchase order
during processing. The intervention of the state machine
300 also allows the ability to force an order into a
particular state or manually set certain flags by hand.

20   As such, the state machine 300 of the present invention
allows enhancements to the state diagram for manageable
changes to the Order Processing System 30. Additions or
deletions of new states, arcs, and conditions change the
paths an order takes through the order processing

25   operation. As will be hereinafter more fully explained,
a purchase order during processing under control of state
machine 300 can only come to rest at a predetermined
number of processing stations or states (e.g., H, M, N,
O, X, etc.) as shown in Figure 2.

30   Each block represents a state in which a purchase
order being processed by the Order Processing System 30
can occupy. According to the present invention, a
purchase order being processed by the Order Processing

System 30 must move from one state to the other except in the states indicated in bold, e.g., states (H), (M), (N), (O), (X), and (W). These are the only states according to the present invention in which a purchase order can be
5   at rest at a final destination. All other states are transient and the order will eventually move to the next state, or eventually flagged with an error condition which triggers an alarm to customer service indicating an abnormality in the order processing. For example, an
10 order that has been placed for a product in stock but never shows up as being shipped (i.e., stuck in the "in-stock" state) times out after a predetermined time period and is flagged as an error.

With the Order Processing System 30 of the present
15 invention functioning as a state machine as described above, a purchase order can only be in predetermined states at any given time thereby facilitating ease of tracking of the status of an order.

A detailed description of each of the sub-systems is
20 provided hereinafter.

Multi-Level Fraud Detection

The Fraud Detection sub-system 310 of the present invention is a multi-level fraud checking system used to determine if an order is a valid order. As shown in
25 Figure 1, when an order is passed from the Online Shopping System 20, the Order Processing System 30 receives the order information such as credit card information, billing address, shipping address, quantity of selected products, sales prices of the products, etc.
30 This order information is initially passed through the Fraud Detection sub-system 310.

The Fraud Detection sub-system 310 initially performs a data integrity check on the order information

for completeness such as billing address information, shipping address information, and method of payment. For credit card purchases, the credit card information is checked to verify that the credit card is not yet

5   expired. If the data integrity check fails on the order, the customer is notified of the incomplete portions of the order for correction. Once the order passes the data integrity check, the order then proceeds to a gross fraud check.

10   Gross fraud check involves searching the Fraud Database 730 internal to the transaction processor 10 of the present invention for history of bad credit by the customer submitting the order. The gross fraud check of the present invention acts as an initial filter for

15   rejecting obvious fraudulent orders such as orders from "black-listed" customers in the Fraud Database 730 with previous histories of bad credit, orders from counties other than the United States under economic crisis, etc. If an order fails the gross fraud check, the order is

20   passed to Customer Service 340 and the customer is immediately notified of the reasons why the order cannot be processed. If, on the other hand, the order passes the gross fraud check, the order is then checked for credit card authorization from a financial institution,

25   such as a commercially available fraud check service.

        Based on the information received from the financial institution, a fraud level score, for example, is generated. The fraud level score is a grading system that indicates the level of risk the order will pose to

30   the business by processing the order. The score is then compared with a predetermined threshold or a plurality of thresholds. Each threshold serves as a trigger to invoke other fraud rule based checks to be performed in

conjunction with the score to determine the total status of the failed orders. This allows the failed order to be characterized by several types of failures given a total overall score. If the order passes the fraud checks, it

5　is sent for finalized order processing. If, however, the order does not pass muster under the fraud checks, it is sent into a sorting bin. The sorting bin of the present invention acts as a buffer to minimize discarded orders. According to the present invention, a dynamic sorting

10　procedure is performed on the rejected orders stored in the sorting bin.

　　　The failed orders in the sorting bin are analyzed for reasons why the fraud level score was so high. Failed orders are analyzed for previous purchases by the

15　customer, whether the customer is an account holder, etc. and sorted between high risk and low risk orders. For instance, orders from repeat customers who otherwise have a good history of previous purchases, for example, are low risk orders even though the fraud score is high and

20　orders from customers who have no previous purchase history pose a high risk on defaulting on payments. Subsequently, the sorted orders are either sent to Customer Service 340 to be altered and resubmitted for validation or stored in a list of bad names in the Fraud

25　Database 730 to be used in the gross fraud check of subsequent orders.

　　　Alternatively, if there are generally a high number of failed orders in the sorting bin preventing sales of products, the fraud scores are analyzed and the threshold

30　is dynamically modified to reduce the number of orders being rejected by the Order Processing system 30. By incorporating multi-level fraud checking system in the manner of the present invention, orders that would

18

otherwise be lost can be recovered thereby increasing
business transactions.

Distributor Selection

Once an order has been checked for fraud and passes
5   as a valid order, the products in the order are checked
by the Distributor Selection sub-system 330 to determine
which distributor will be used to fill the order. The
selection of a distributor may be determined by several
different methods.

10   Preferably, as shown in Figure 4, when an order is
received by the Distributor Selection sub-system 330, the
product information such as the product SKU (i.e., Stock-
Keeping Unit) number and quantity is determined from the
order and sent to the data input 331. This information
15   is then sent to each of the distributors and the
distributors are polled for availability, quantity
available by the distributor, and the current price for
the product, for example. The information received from
each of the distributors are then used by the distributor
20   selection logic 332 to determine which distributor will
fill the order. When more than one distributor can fill
the order, the product information from each of the
available distributors is processed by the distribution
logic 332 based on the rule-based algorithm similar to
25   the Catalog Builder/Price Modeler 50 to determine which
distributor will be able to best fill the order.

Figures 5 and 6 show an example of the logic blocks
that make up the distributor selection logic and the
logic sequence, respectively. The sequence of the logic
30   as shown in Figures 5 and 6 are for illustrative purposes
only. It would be within the scope of one with ordinary
skill in the art to vary the logic order to thereby vary
the priority of the selection criteria used in selecting

the desired distributor. The product information from
the authorized order is input into the product data input
331. The ordered product is then compared in the
inventory comparator 333 to determine which of the

5   distributors have the ordered product in stock. If none
of the distributors have the product in stock, the
customer is advised of the back order of the product.
The result of the inventory check is then sent to the
price comparator 334. If only one distributor has the

10   ordered product in stock, then the result is cascaded
down until the selected distributor data 337 is submitted
to the Order Processing System 30 to finish processing
the order.

If more than one distributor has the ordered product

15   in stock, the result is compared in the price comparator
334 based on a predetermined rule, such as to choose the
distributor offering the lowest price. Again, if the
result of the comparison returns only one distributor,
then the result is cascaded down and the selected

20   distributor data 337 is used by the Order Processing
System 30 to finish processing the order. If more than
one distributor has the same price, then the result is
sent to the user defined rule-based logic section 336.

User defined rule-based logic section 336 uses user

25   defined rules and algorithms to further narrow the choice
of distributors to fill the order. For instance,
selective rules and algorithms may be set to choose a
distributor that would return the maximum amount of
profit margin for the sale of the ordered product. This

30   may include factors other than cost, such as free or
different priced shipping charges from each distributor.
It may be that one distributor charges a handling fee on
orders less than $500, for example, while another may

charge a flat fee regardless of the size of the order.
Alternatively, the rules in the user-defined rule-based
selection logic 336 may be set such that, for example, a
distributor with a special contracting agreement is
5   selected regardless of profit margin comparison results.

     Once a distributor has been selected, the result is
used by the Order Processing System 30 to finish the
order processing such as authorizing the selected
distributor to ship the product and to notify the
10 customer of the shipping information, for example. In
addition, as indicated in Figures 5 and 6, each of the
comparators have a manual input line for receiving
modifications to the rules and algorithms used in making
the comparison. According to the present invention,
15 customer service 340 may modify and/or override each of
the parameters used in performing the distributor
selection.

     Alternatively, if the connection between some or all
of the distributors cannot be established during an
20 ordering processes, the product information stored in the
Product Database 720 may be used instead of delaying the
processing of the orders. As explained above, the
products information is updated preferably continually
throughout a business day. Therefore, even if a
25 connection cannot be made at the time of the order, the
product information is accurate enough to fill the order.

     Once a distributor selection is made, the
Distribution Selection sub-system 330 forwards the order
electronically to the selected distributor to fill the
30 order. The Distributor Selection sub-system 330 then
receives verification from the distributor such as
customer number, warehouse information, shipment date,
invoice amount, shipping cost, tracking number, etc. and

stores the order information in the Order Database 740 to make it immediately available to the customer service and the customer's online account.

Credit Card Services

5   Credit Card Services sub-system 320 receives the orders forwarded to the distributor by the Distributor Selection sub-system 330 and forwards the total cost of the order to the Payment Processing System 40 to be charged to the customer's credit card. Alternatively, if

10   a product has been returned, the Credit Card Services sub-system 320 processes the RMA (i.e., Returned Merchandise Authorization) and sends the request to the Payment Processing System 40 to refund the amount to the customer.

15   ## Customer Service

Customer Service sub-system 340 provides a feedback interface between the E-Commerce business using the transaction processor 10 of the present invention with the customers. Customer Service sub-system 340 allows

20   the customer service representatives to access any part of the order processing being performed by the Order Processing System. Customer Service 340 provides the interface into the Order Processing System 30 by handling failed orders, sorted orders from failed orders, customer

25   inquires to order/RMA status, and other customer service issues.

In particular, Customer Service sub-system 340 provides automated feedback to the customer. For instance, once an order has been properly processed, the

30   Customer Service sub-system 340 will send an automated message to the customer with the order information such as customer number, shipment number, tracking number, etc. In cases where orders have failed during the

processing period, Customer Service sub-system 340
automatically generates notices to the customer and/or
customer service relaying that the order has failed and
provides further instructions on how to correct the

5 problem. Additionally, Customer Service sub-system 340
may be programmed to send customers in the Customer
Database 710 periodic newsletters, promotional offers,
exclusive sales, coupons and incentive, etc. Moreover,
this periodic feedback to the customer can be highly

10 personalized based on the information stored in the
Customer Database 710 such as the customer's buying
patterns.

Payment Processing System

       The Payment Processing System 40 receives order/RMA

15 information from the Order Processing System 30 in
conjunction with the payment method information. For
credit card orders, the Payment Processing System 40
contacts the financial institution issuing the credit
card and charges the account holder for purchases or

20 credit the account for processed RMAs.   For non-credit
card orders, the Payment Processing System 40 may issue
bills, receive CODs (i.e., cash-on-delivery) and checks,
issue refunds, process wire-transfers, etc. Moreover,
the present invention may also take advantage of online

25 leases and loans, a relatively new service in the area of
e-commerce.

       With respect to the online loans, once a customer is
finished shopping with the Online Shopping System 20 of
the present invention, the customer applies

30 electronically to a financial institution for a loan.
When the loan has been approved, the financial
institution sends a loan number and the loan balance
limit to the Order Processing System 30. The Payment

Processor 40 then proceeds to use the loan number as a
credit card number and finishes the transaction be
drawing on the approved loan from the financial
institution.

5   With regard to the online lease, once a customer is
finished shopping, the customer applies for a lease from
a financial institution. When the application is
approved, the financial institution sends a lease number
to the Order Processing System 30. The Payment Processor

10   40 then proceeds to use the lease number as a credit card
number and finishes the transaction drawing on the
approved balance from the leasing institution. The
purchase is then shipped directly to the customer, but as
with all leases, the leasing institution owns the

15   products.

Example of Ordering Online

        The transaction processor 10 of the present
invention will be described with specific embodiments to
more clearly describe the functionality of the present

20   invention. However, equivalent components and obvious
modifications within the ability of one with ordinary
skill in the art may be used without departing from the
scope of the present invention.

        The transaction processor 10 of the present

25   invention is built on industry standard equipment
including Sun UltraSparc servers, Solaris operating
system, Apache Web servers, and Oracle databases.
Preferably, each of the systems and sub-systems are
installed on a dedicated server running in parallel in a

30   distributed processing architecture.

        A customer accesses the Online Shopping System 20
via the company's Web page through a public Web server
110, such as the customer's ISP (i.e., Internet Service

Provider). Once on the company's Web page, the customer is issued a unique identification number using various techniques such as using the customer's IP (i.e., Internet Protocol) address, IP host name, personal
5   information, etc. so that others accessing the Online Shopping System 20 do not share each others' shopping information. The customer then browses/searches the Web site (i.e., electronic catalog) for a particular product. The customer selects the product or products and the
10   Online Shopping System 20 places the selected products in an electronic shopping cart.

At the time of checkout, the customer is asked to create a customer account asking for personal information such as name, billing address, telephone number, email
15   address, as well as some profile information (all of which may be optional) to generate a customer account. If the customer already has an account, then the account ID is used to identify the customer and the customer is prompted for their password.

20   Once a customer account has been established, the order is filled out for the products to be purchased including quantity, method of payment (the credit card number may be established in the customer account so that it does not have to be inputted every time), shipping
25   address, and method of shipment. When the order is completed, the order is passed onto the Order Processing system 30.

The Fraud Detection sub-system 310 performs a data integrity check such as whether each of the required
30   fields of the order form are filled out, checksum test of the credit card number, etc. If the order fails the integrity check, the customer is prompted with an error message requiring to resubmit the order with the

25

corrections. If the order passes the integrity check,
then the order undergoes the gross fraud check.

The gross fraud check determines whether the
customer has a history of defaulting on payments, whether
5   the credit card number is a valid number, or is ordering
from a "black-listed" location such as Romania or Russia.
If the order fails the gross fraud check, the order is
sent into a sorting bin. If the order passes the gross
fraud check, the order is sent to a commercially
10   available fraud checking service such as CyberSource®.
CyberSource® processes the order information and returns
a fraud score. The fraud score is then compared to a
plurality of predetermined threshold that may be modified
by customer service 340 and used in conjunction with
15   other fraud rule based checks. If the order fails, it is
placed into the sorting bin. If the order passes, it is
sent to the Distributor Selection sub-system 330 for
further processing.

As for the orders in the sort bin, the failed orders
20   are sorted between high risk and low risk orders such as
whether the order was from an account holder who has good
credit history from past purchases, whether the fraud
score was too high because the billing address did not
match the address of the credit card, etc. The plausible
25   orders are then forwarded to the Customer Service sub-
system 340 from which the Customer service
representatives either contact the customer to clarify
the discrepancies or override the fraud checks and place
them into the processing bin to be sent to the
30   Distributor Selection sub-system 330 for further
processing. The rest of the failed orders are placed in
the Fraud Database 730.

26

The Distributor Selection sub-system 330 sends the product information (i.e., SKU and quantity) to each of the distributors such as independent pick, pack, and ship distributors and receives information on the products

5 such as availability and cost. The Distributor Selection sub-system 330 forwards this information to the Catalog Builder/Price Modeler 50 and profit margins are calculated. The Distributor Selection sub-system 330 then selects the distributor with, for example, the

10 highest margin or other selected criteria for particular products and forwards the order electronically. Once the distributor fills the order, the Customer Service sub-system 340 either receives or retrieves the order information such as the customer number, warehouse

15 number, shipment date, shipment tracking information, invoice amounts, etc.

Customer Service sub-system 340 emails the customer within minutes after a valid order is received with a confirmation number. The Customer Service sub-system 340

20 emails the customer again when the order is shipped by the distributor or notifies the customer that the product is not available and has been placed on back order.

The preceding description has been presented only to illustrate and describe the invention. It is not

25 intended to be exhaustive or to limit the invention to any precise form disclosed. Many modifications and variations are possible in light of the above teaching.

The preferred embodiment was chosen and described in order to best explain the principles of the invention and

30 its practical application. The preceding description is intended to enable others skilled in the art to best utilize the invention in various embodiments and with various modifications as are suited to the particular use

contemplated.   It is intended that the scope of the
invention be defined by the following claims.

What is claimed is:

1. An improved internet-centric transaction processor for authorizing and facilitating retail sale of ones of a plurality of selected products to retail
5   customers directly from a plurality of distributors of said products comprising:

a database for storing catalog-type product data for a plurality of selected products;

a communication interface for selectively
10 permitting ones of said retail customers to selectively access said product data stored on said database;

an electronic order form for permitting said retail customers to place a purchase order for ones of said selected products;

15 an order processor for processing purchase orders for ones of said selected products, said order processor further including

a distribution selection processor for dynamically allocating a particular product order to
20 one of said plurality of distributors which handle a particular product involved in said purchase order based upon predetermined selection criteria and authorizing a selected distributor to ship said ordered product to said retail customer; and

25 a payment processor for billing said retail customer for said ordered product authorized for shipment.

2. The improved transaction processor of claim 1, said distribution selection processor further includes
30 a comparator for comparing like types of product data for a plurality of distributors handling said like product to determine an optimum distributor selection based upon a plurality of selection criteria

including product price, availability, shipping date,
shipping location or discount data.

3.   The improved transaction processor of claim 1
further including means for modifying ones of said
5   predetermined selection criteria.

4.   An improved internet-centric electronic
transaction method executable by a computer for
facilitating retail sales of ones of a plurality of
selected products to retail customers directly from a
10   plurality of distributors of said products comprising the
steps of:

    generating catalog-type product data for said
products in a selectively addressable database,

    permitting ones of said retail customers to
15   selectively access said product data stored in said
database and allowing said retail customers to submit
product orders of said selected products;

    processing said purchase orders from ones of
said retail customers by selecting one of said plurality
20   of distributors to sell said selected product based upon
a plurality of predetermined distributor product
selection criteria;

    authorizing said selected distributor to ship
said ordered product to a retail customer in a manner
25   which is transparent to said retail customer;

    authorizing said purchase orders based upon a
credit worthiness check of information supplied by said
retail customer in connection with said purchase order;
and

30   billing said retail customer for said ordered
product when said distributor has been authorized to ship
such ordered product to said retail customer.

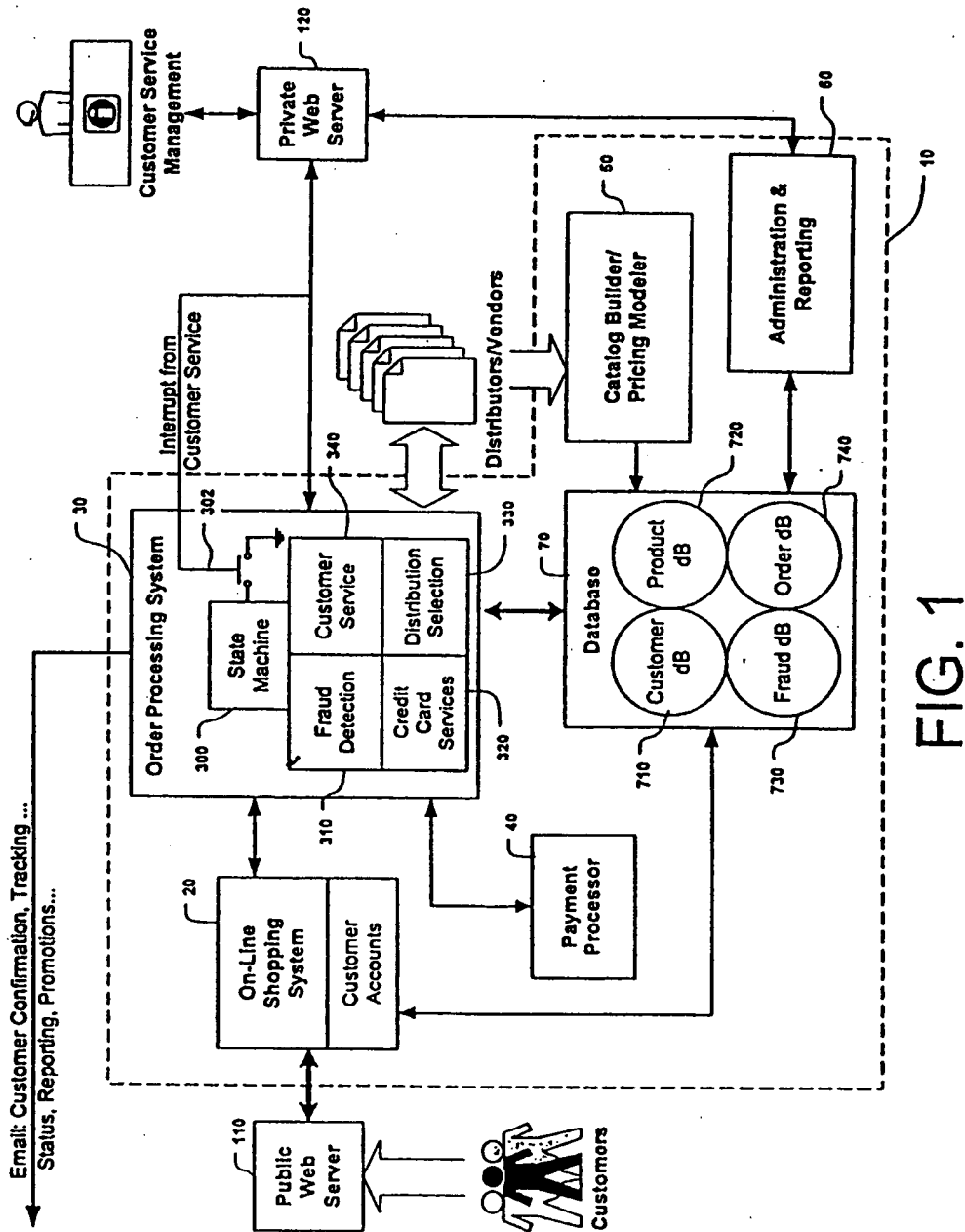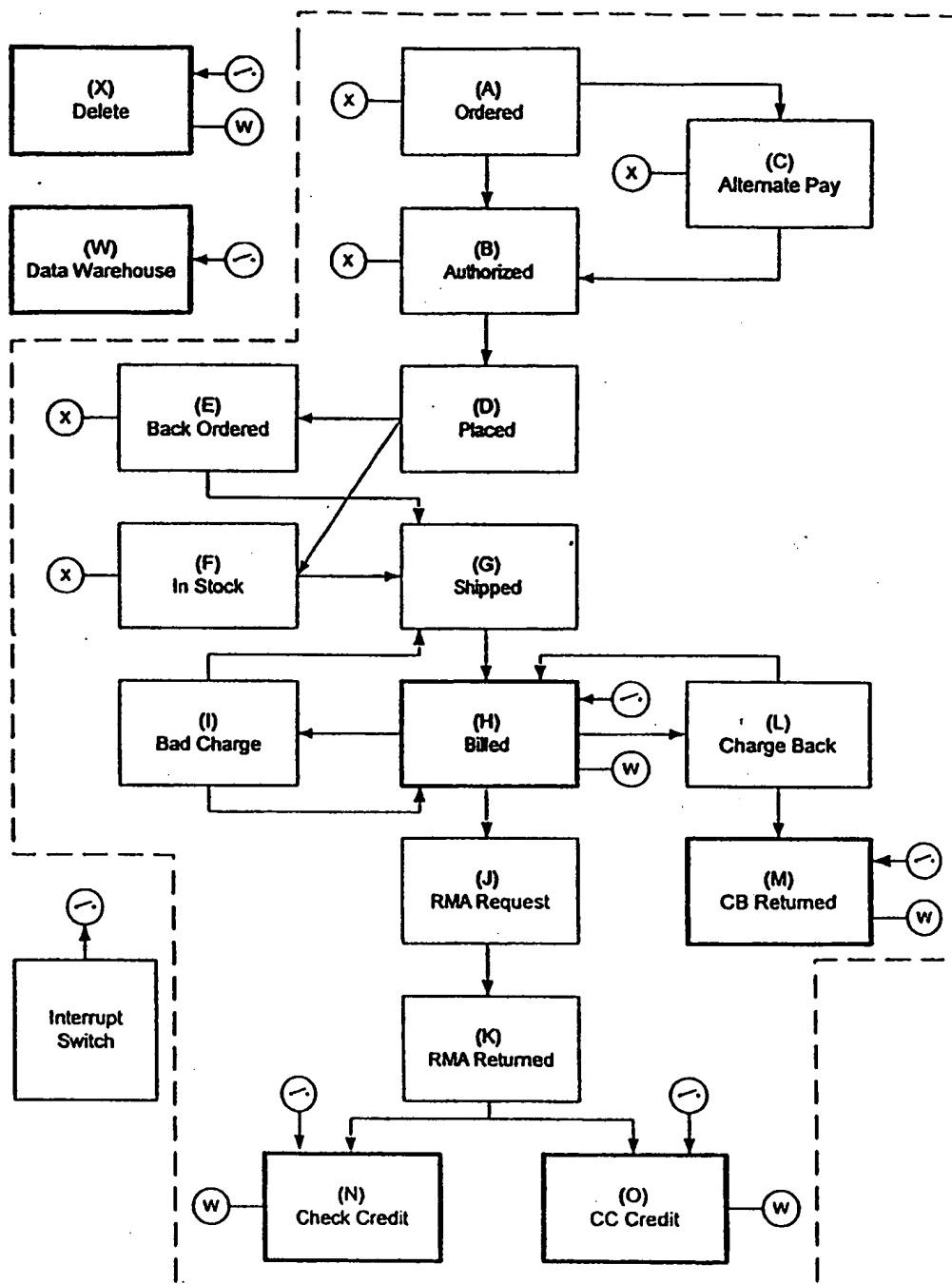5.   The improved internet-centric electronic transaction method of claim 4 further including the step of periodically modifying ones of said predetermined selection criteria.
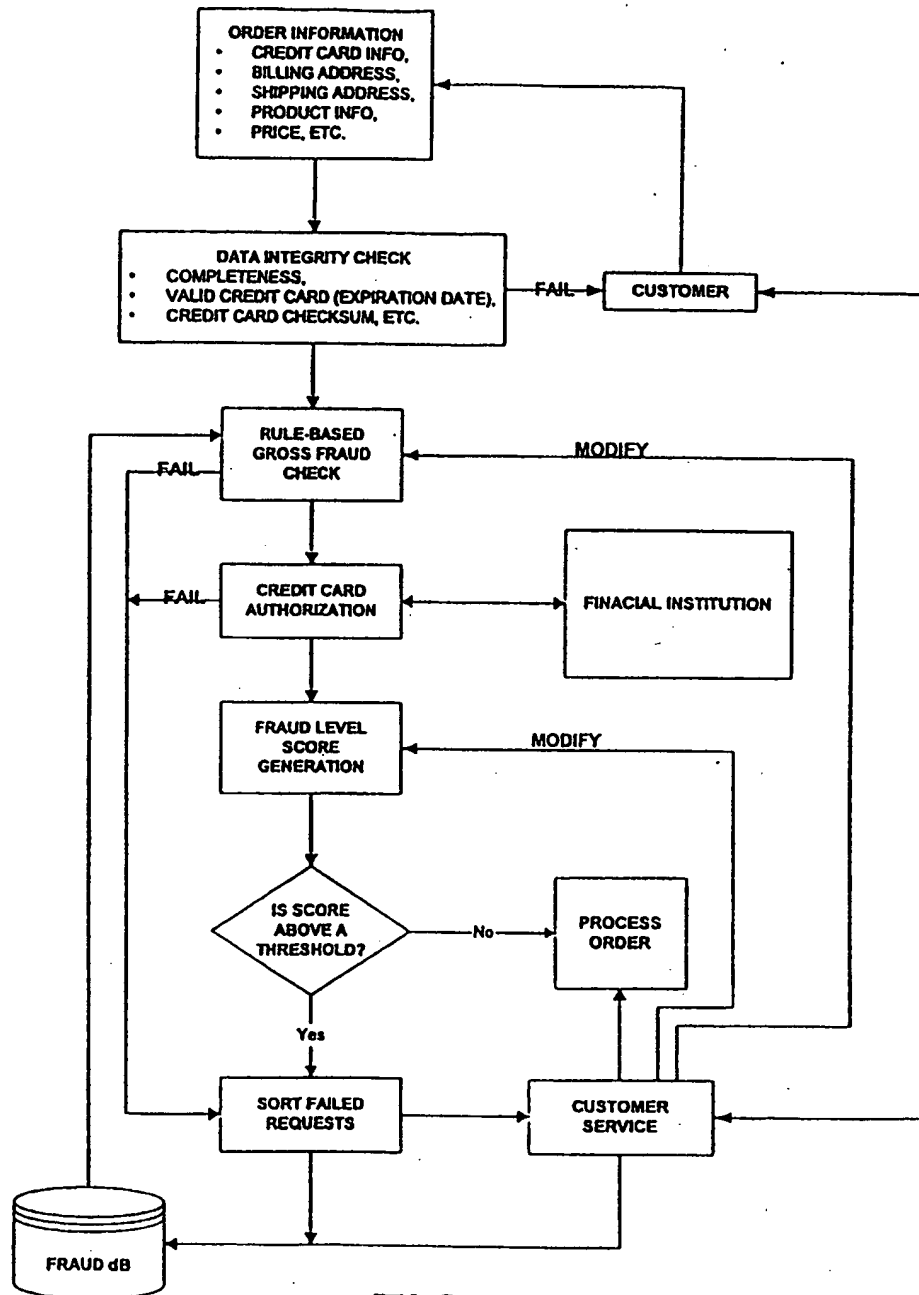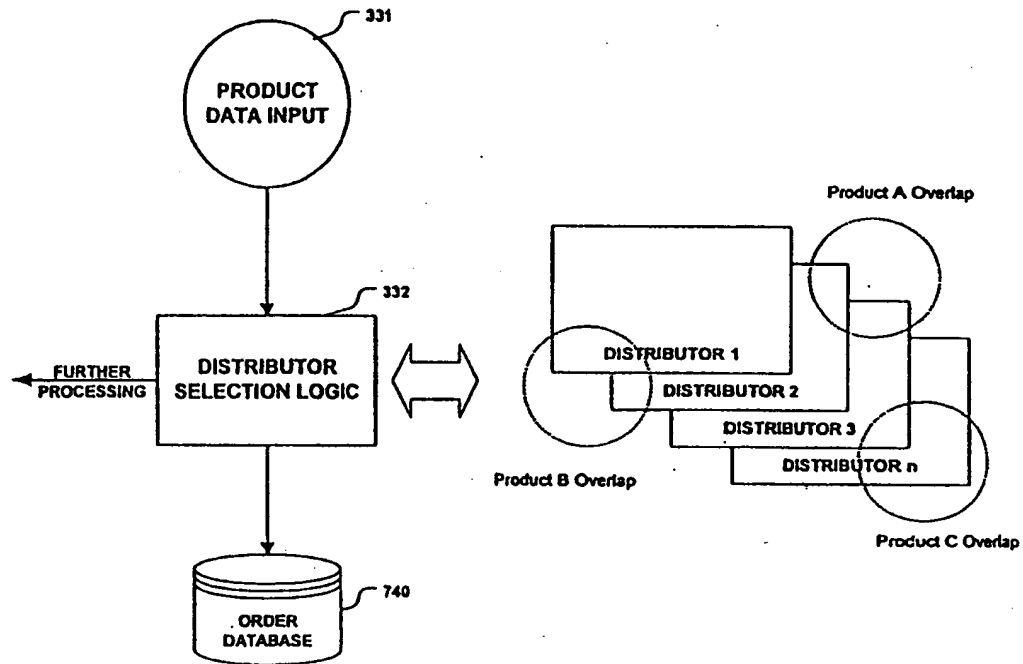
FIG. 1

FIG. 2

FIG. 3

FIG. 4
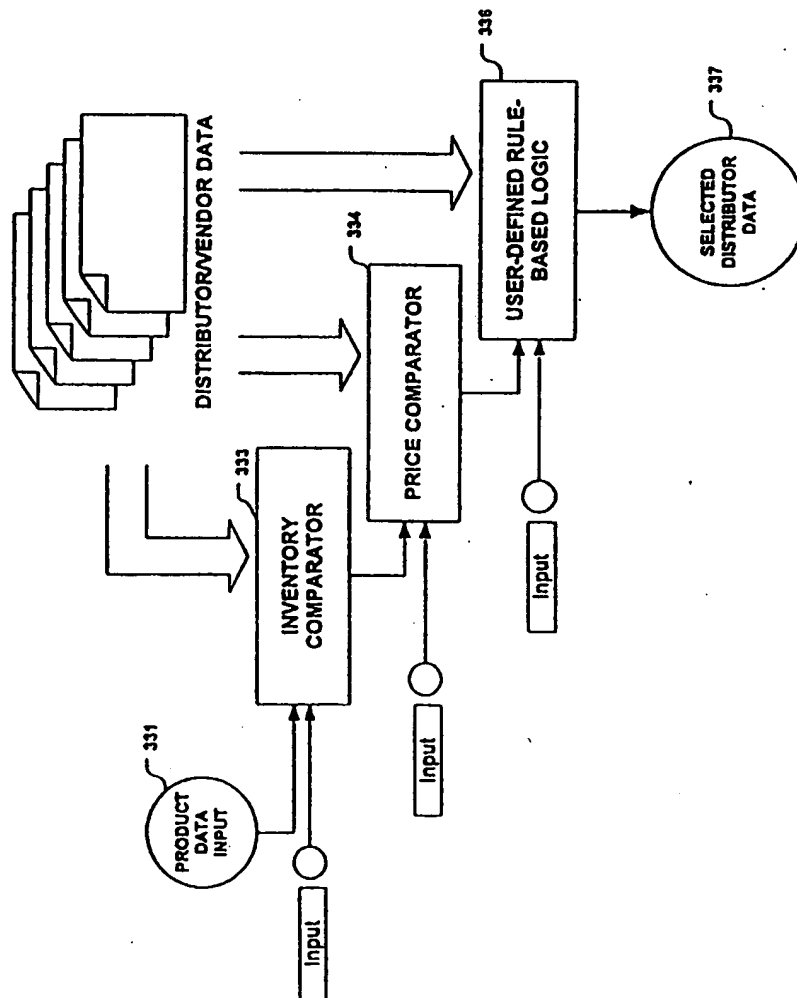
FIG. 5

6/6

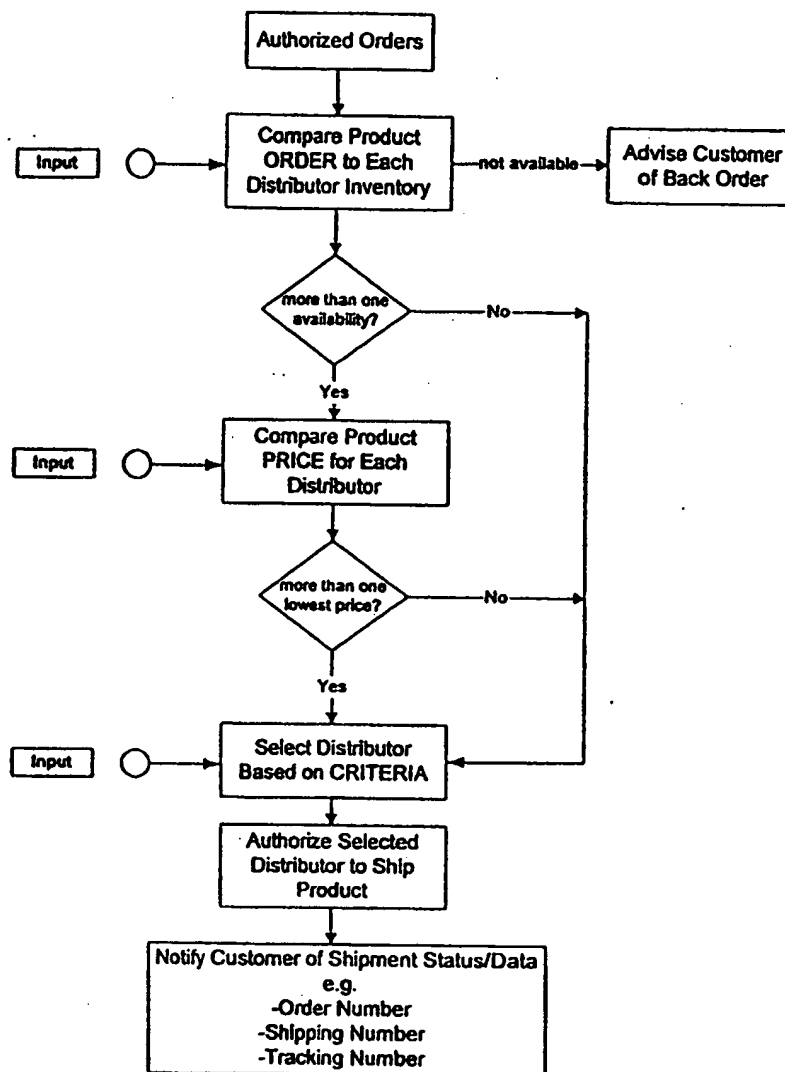
FIG. 6

INTERNATIONAL SEARCH REPORT

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7   G06F17/60

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7   G06F

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 5 742 931 A (KRAETZ JOSEPH ET AL) 21 April 1998 (1998-04-21) abstract; figure 1 claims 1,2,4 column 1, line 22 - line 59 column 2, line 19 -column 3, line 17 ---	1,4
A	US 4 992 940 A (DWORKIN ROSS E) 12 February 1991 (1991-02-12) abstract; figure 1 column 1, line 13 - line 60 column 2, line 49 -column 3, line 14 claim 1 ---	1,4
	-/--	

| X | Further documents are listed in the continuation of box C. | | X | Patent family members are listed in annex. |

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance
"E" earlier document but published on or after the international filing date
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
"O" document referring to an oral disclosure, use, exhibition or other means
"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
20 March 2000	27/03/2000

Name and mailing address of the ISA	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax (+31-70) 340-3016	van der Weiden, A

Form PCT/ISA/210 (second sheet) (July 1992)

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication,where appropriate, of the relevant passages	Relevant to claim No.
A	WO 93 24892 A (PASCAL CHRISTIAN D ;ROUGHGARDEN EDWARD CRAIG (US)) 9 December 1993 (1993-12-09) abstract page 1, line 4 -page 2, line 3 page 7, line 15 -page 8, line 11	1,4
A	US 5 799 284 A (BOURQUIN ROY E) 25 August 1998 (1998-08-25) abstract column 2, line 40 -column 3, line 7	1,4
A	EP 0 855 687 A (AT & T CORP) 29 July 1998 (1998-07-29) abstract; figure 2 page 2, line 49 -page 3, line 23	1,4
E	US 6 016 504 A (DOBSON JENNIFER L ET AL) 18 January 2000 (2000-01-18) abstract; figure 1 column 4, line 1 - line 32 column 5, line 24 - line 62 column 8, line 9 - line 44 claim 1	1,4

Intern nal Application No

PCT/US 99/24453

Patent document cited in search report		Publication date	Patent family member(s)		Publication date
US 5742931	A	21-04-1998	US	5402336 A	28-03-1995
US 4992940	A	12-02-1991	NONE		
WO 9324892	A	09-12-1993	NONE		
US 5799284	A	25-08-1998	NONE		
EP 0855687	A	29-07-1998	CA	2222229 A	15-07-1998
			JP	10207945 A	07-08-1998
US 6016504	A	18-01-2000	NONE		

THIS PAGE BLANK (USPTO)